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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yuhzoh Tsuda

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12/17/2002

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755 PAGE MILL RD
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EXAMINER

BLUM, DAVID S

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 12/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/904,162

Applicant(s)

TSUDA ET AL.

Examiner

David S Blum

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-28 and 37-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27,28,40,43,46,49,52,55 and 58 is/are allowed.
- 6) ☒ Claim(s) 25,26,37-39,41,42,44,48,50,51,53,54,56 and 57 is/are rejected.
- 7) ☒ Claim(s) 45 and 47 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/289,575.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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This action is in response to the Request for continued Prosecution and amendment D, papers #14 and 15, respectively, filed 10/25/02.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 25-26, 37-38, 39, 41, 48, 50-51, 53-54, and 56-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usui in view of Pribat (US 4,999,314) and Bozler (US 5,362,682).

Usui teaches all of the parts of the device of claims 25-26, 37-38, 39, 41, 48, 50-51, 53-54, and 56-57 except for a second semiconductor crystal layer and the stripe shaped electrode. Usui teaches light emitting device with a mask containing a growth suppressing effect on a substrate and a semiconductor crystal layer on the substrate formed via the mask (see results and discussion and figures 1 and 3). The layers of Usui are formed in different plane directions (results paragraph 2), thus they are "twisted" or angled from each other. The masks also are formed over the entire substrate surface (figure 1). The thickness of the two layers is the same (paragraph 2) as in claims 51 and 53. Although Usui uses a sapphire substrate, it is taught that a GaN substrate may be used (introduction, paragraph 2 line 2) as in claims 54 and 56. Usui

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also teaches the layers may be of the same material (introduction paragraph 2) as in claims 48 and 50. The width of the two mask patterns is the same in Usui, as in claims 39 and 41.

Pribat describes multiple layers using lateral epitaxial overgrowth (figure 54, and column 12 line 27-column 13 line 16). Pribat also teaches the second mask (n+1) substantially over the opening in the lower mask and at an angle (figure 14).

Thus it would have been obvious to one of ordinary skill at the time of the invention to combine the substrate fabricated by Usui with further fabrication of semiconductor layers on the wafer by the same technique as suggested by Pribat in order to lower the dislocation density of the substrate with subsequently less defect propagation into a semiconductor device built into the substrate.

Bozler describes fabrication of lateral semiconductor layers from an optionally separable substrate (abstract). Boozler also shows a striped shaped ridge 3 microns from the mesa, forming a n-type electrode.

Thus it would have been obvious to one of ordinary skill at the time of the invention to combine the substrate fabricated by Usui with the substrate separation of Bozler in order to decrease on substrate costs and to provide a stripe shaped ridge for the electrode.

3. Claims 42 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Usui in view of Pribat (US 4,999,314) and Boozler (US 5,362,682) as applied to claims 25 and 37 above, and further in view of Edmond (US005592501A).

Usui, Pribat, and Boozler teach all of the positive steps of claims 42 and 44 except for the make-up of the quantum-well layer and the cladding layer. Edmond teaches a quantum-well layer of InGaN and a cladding layer of InAlGaN (column 5 lines 30-65 and column 6 lines 4-10). Although in column 6 lines 4-10, Edmond teaches the cladding layers (14 and 15) are of un-stoichiometric AlGa_N, in column 5 lines 29-49, Edmond teaches the cladding layer may also be ABCN where A, B, and C are group III elements (ie. IN, Ga, and Al) and line 59 suggests the trace element to be Indium. Although this line refers directly to the waveguide layers, the preceding lines indicate the four elements may comprise the cladding layer.

One skilled in the requisite art at the time of the invention would modify Usui, Pribat, and Boozler, by providing the layers as described by Edmonds, to complete the structure to produce a light emitting structure.

Allowable Subject Matter

4. Claims 45 and 47 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 45 and 47 limit the width of the stripe of the second mask to be smaller than the opening of the first mask. This limitation in combination with the other limitations of

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claim 1 is not taught or suggested by the prior art of record. Usui, Pribat, Bozler, and Edmond are silent as to this feature and do not suggest decreasing mask widths.

5. Claims 27-28, 40, 43, 46, 49, 52, 55, and 58 are allowed.

6. The following is an examiner's statement of reasons for allowed:

Claims 27 and 58 limit the structure of a semiconductor substrate to having consecutive masks that are angled at 90-120 degrees (claim 27) or at about 90 degrees (claim 58) from each other. This limitation in combination with the other limitations of claims 27 and 58 is not taught or suggested by the prior art of record. Usui teaches the two layers with a different orientation but does not teach a specific angle or angle range. Bozler teaches forming slits in the same layer of the mask at 90-degree angles, but not a rotation of mask layers.

Claims 28, 40, 43, 46, 49, 52, 55 are allowable as being dependant upon allowable claim 27.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Blum whose telephone number is (703)-306-9168 and e-mail address is David.blum@USPTO.gov.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr., can be reached at (703)-308-4940. Our facsimile number for Before-Final Communications is (703)- 872-9318 and for After-Final Communications is (703)- 872-9319. The facsimile number for customer service is (703)-872-9317. Our receptionist's number is (703)-308-0956.

David S. Blum

December 12, 2002


CARL WHITEHEAD, JR.
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